Amendments to the Drawings:

The attached 5 sheets of replacement drawings include changes to Figures 1, 3, 10, 20 and 24. These sheets, which include Figures 1, 3, 10, 20 and 24, replace the original sheets including Figures 1, 3, 10, 20 and 24.

Attachments: 5 Replacement Sheets

5 Annotated Sheets

REMARKS

This paper is responsive to the Office Action mailed April 19, 2006. Claims 1, 2, 10, 11, 16, 22 and 23 have been amended. Support for all amended claims can be found in the specification, and no new matter has been added by these amendments. Claim 24 is cancelled. Claims 1-23, 25 and 26 are currently pending in the above-identified application. Reconsideration of the claims in view of the amendments and the following remarks is respectfully requested.

Drawing Objections

The Examiner has objected to Figure 3 for failing to comply with 37 C.F.R. §1.84(p)(5). Figure 3 has been amended to include reference number 306. Applicants have further amended Figures 1, 10, 20 and 24 to include appropriate reference numbers and flow diagram labels as shown in red on the attached Annotated Sheets. Withdrawal of the objection to the drawings is respectfully requested.

Claim Objections

The Examiner has objected to claims 1-21 because of informalities. Specifically, claim 1 includes the limitation "the input arbitration circuit" which lacks antecedent basis. Claims 2-22 are objected to because of their dependence on claim 1. Claim 1 has been amended to recite "the input arbitration module," for which there is sufficient antecedent basis. Since the informality has been corrected, withdrawal of the objection to claims 1-21 is respectfully requested.

Claim Rejections under 35 U.S.C. §103

Claims 1-2, 5-7, 10-12, 22, 24 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,260,131 issued to *Kikuta* in view of U.S. Patent No. 6,003,123 issued to *Carter*. Claims 3, 4 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Kikuta* and *Carter* in view of U.S. Patent Publication No. 2005/0044340 by *Sheets*. Claims 8 and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over

Kikuta and *Carter* in view of U.S. Patent No. 6,075,938 issued to *Bungion*. Claim 13 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Kikuta* and *Carter* in view of U.S. Patent No. 5,930,832 issued to *Heaslip*. Claims 14-19 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Kikuta* and *Carter* in view of U.S. Patent No. 6,104,417 issued to *Nielsen*. Claims 20, 21 and 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Kikuta* and *Carter* in view of U.S. Patent No. 5,860,146 issued to *Vishin*. Without conceding the merits of the rejection as applied to the originally filed claims, Applicants respectfully submit that the amended claims overcome this rejection.

Independent claim 1, as amended, recites in part "a primary cluster store having a plurality of locations, each location configured to store a cluster,... wherein each location in the primary cluster store is... configured to store range size information for the cluster stored therein." Claim 1, as amended, also recites "a primary lookup logic circuit coupled to receive the selected translation request from the input arbitration module and configured to associate one of the locations in the primary cluster store with the selected translation request, thereby designating the associated location for storing a target cluster whose range includes the target virtual address." In one feature of the primary lookup circuit, "the range size information for the designated location is set to a value representing a minimum range size in the event that the target cluster is not stored in the designated location at the time the association of the designated location to the translation request is made." In another feature of the primary lookup circuit, "the range size information is set to a value representing an actual range size of the target cluster when the target cluster is loaded into the designated location."

Kikuta teaches translation lookaside buffer (TLB) memory ordering. A client dispatches a memory instruction that includes a memory access code and a linear address that has been translated into a virtual address. If a TLB hit is detected, a memory management unit translates the virtual address into a physical address at which the memory operation is to occur. column 9, lines 28-35. To speed up the translation process, the most recently accessed page table entries are cached in the TLB. column 3, lines 35-38. A TLB entry is updated when a requested virtual page number is not present in the TLB. column 10, lines 4-5.

Carter teaches a memory system with global address translation. A guarded pointer includes six bits that identify the length of a segment containing the pointer. column 4, lines 40-45. The segments may be of any power of 2 size between 1 and 2^{54} bytes. column 6, lines 34-35.

Neither *Kikuta*, *Carter* nor any of the other cited references, alone or in combination, teach all of the features recited in independent claim 1. Specifically, neither *Kikuta*, *Carter* nor any combination thereof teach "the range size information for the designated location is set to a value representing a minimum range size in the event that the target cluster is not stored in the designated location at the time the association of the designated location to the translation request is made." Furthermore, neither *Kikuta*, *Carter*, nor any combination thereof teach "the range size information is set to a value representing an actual range size of the target cluster when the target cluster is loaded into the designated location." Since claim 1, as amended, includes features that are not found in any of the cited references, claim 1 is allowable over the cited art.

Furthermore, claims 2, 5-7 and 10-12 are dependent on claim 1. As discussed above, claim 1 is allowable over the art of record. Thus, claims 2, 5-7 and 10-12 are also allowable for at least the same reasons.

Independent claim 22, as amended, recites limitations similar to the limitations recited in amended claim 1. As discussed above, claim 1 is allowable over the art of record. Thus, claim 22 is also allowable over the cited art for at least the same reasons. Furthermore, claim 25 is dependent on claim 22. As discussed above, claim 22 is allowable over the art of record. Thus, claim 25 is also allowable for at least the same reasons.

Claims 3, 4, 8, 9 and 13-21 depend from claim 1 (either directly or indirectly), and claims 23 and 26 depend from claim 22. The rejection of claims 3, 4 and 9 is premised on the assertion that *Kikuta* and *Carter* disclose the features recited in claim 1 and *Sheets* discloses the remaining features of claims 3, 4 and 9. The rejection of claims 8 and 23 is premised on the assertion that *Kikuta* and *Carter* disclose the features recited in claims 1 and 22, and *Bungion* discloses the remaining features of claims 8 and 23. The rejection of claim 13 is premised on the

assertion that *Kikuta* and *Carter* disclose the features recited in claim 1 and *Heaslip* discloses the remaining features of claim 13. The rejection of claims 14-19 is premised on the assertion that *Kikuta* and *Carter* disclose the features recited in claim 1 and *Nielsen* discloses the remaining features of claims 14-19. The rejection of claims 20, 21 and 26 is premised on the assertion that *Kikuta* and *Carter* disclose the features recited in claims 1 and 22, and *Vishin* discloses the remaining features of claims 20, 21 and 26.

As discussed above, however, neither *Kikuta* nor *Carter*, alone or in combination, disclose or suggest all features recited in amended claims 1 and 22. As best understood, *Sheets*, *Bungion*, *Heaslip*, *Nielsen*, and *Vishin* do not provide any teaching or suggestion that would remedy this deficiency. Therefore, the rejection is based on a flawed premise and cannot be maintained. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 3, 4, 8, 9, 13-21, 23 and 26.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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Attachments
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60814403 v1

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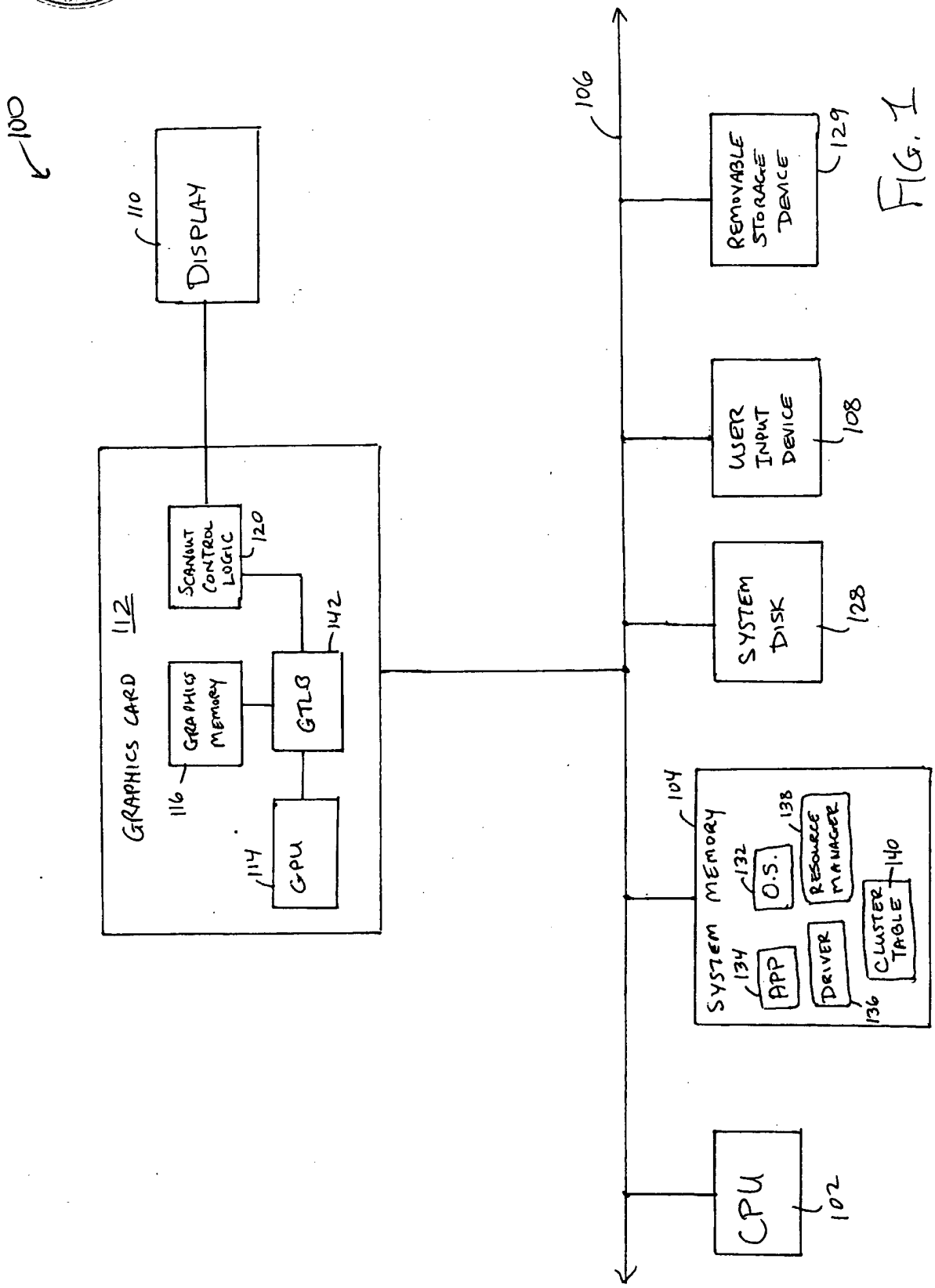

FIG. 1

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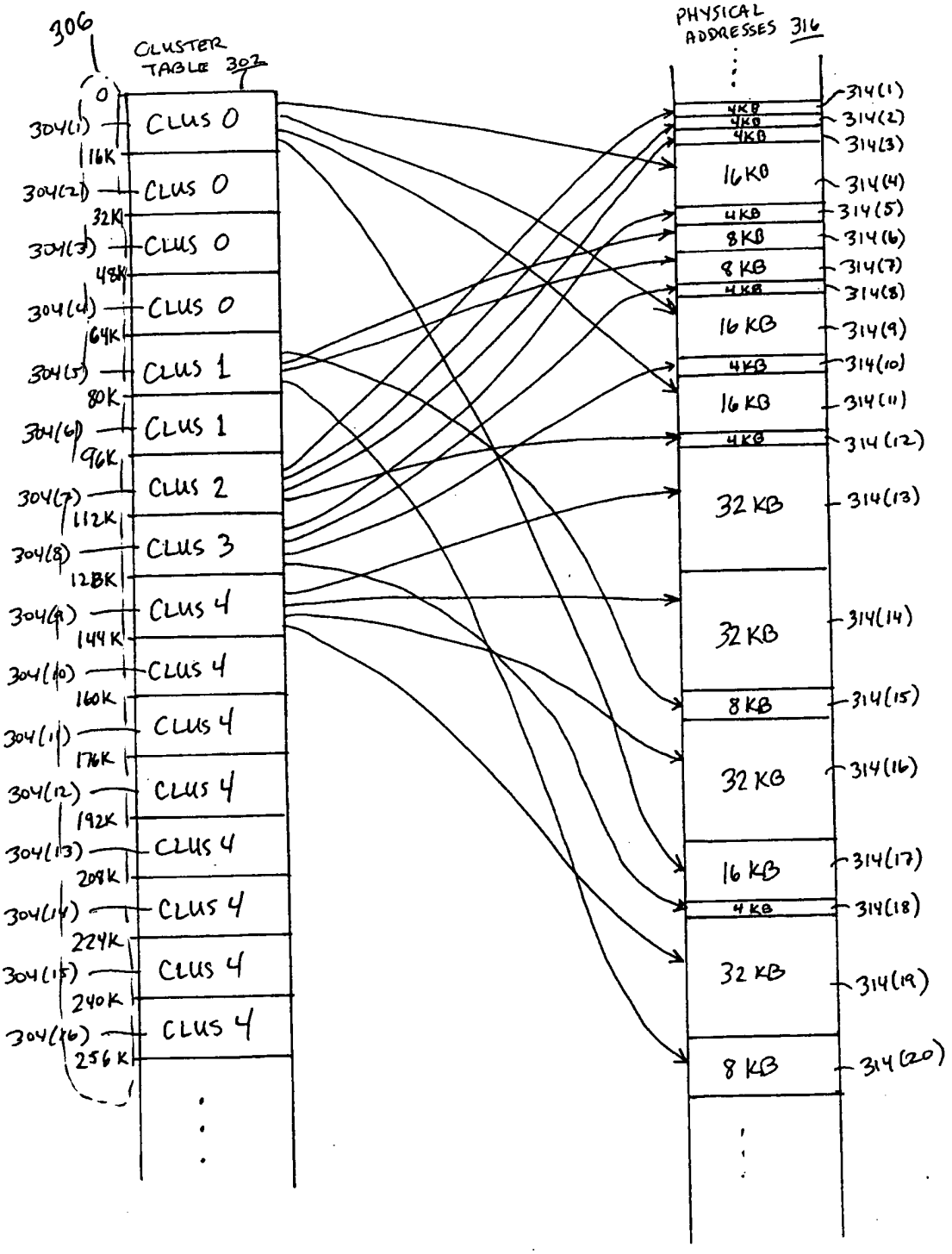

FIG. 3

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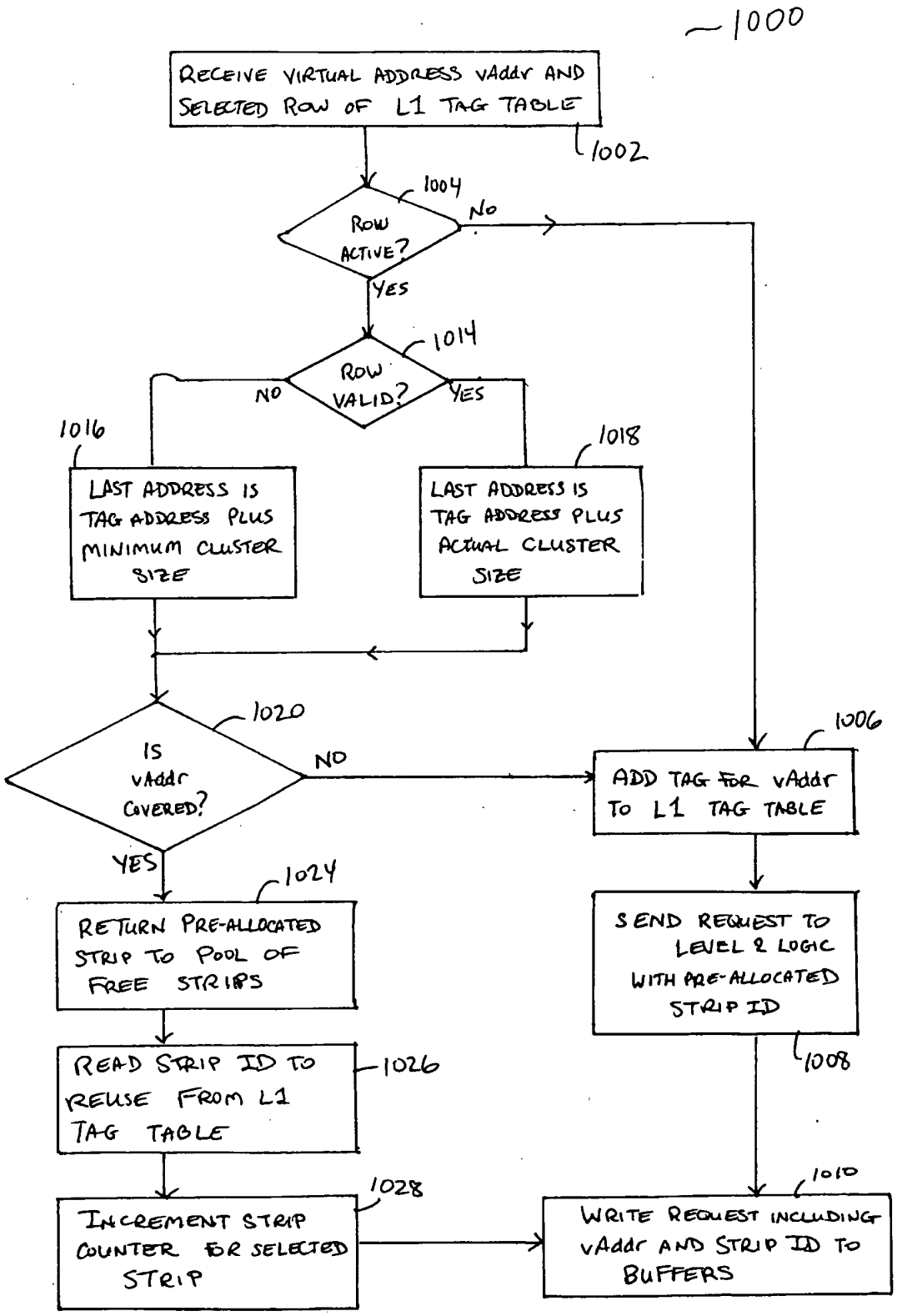

FIG. 10

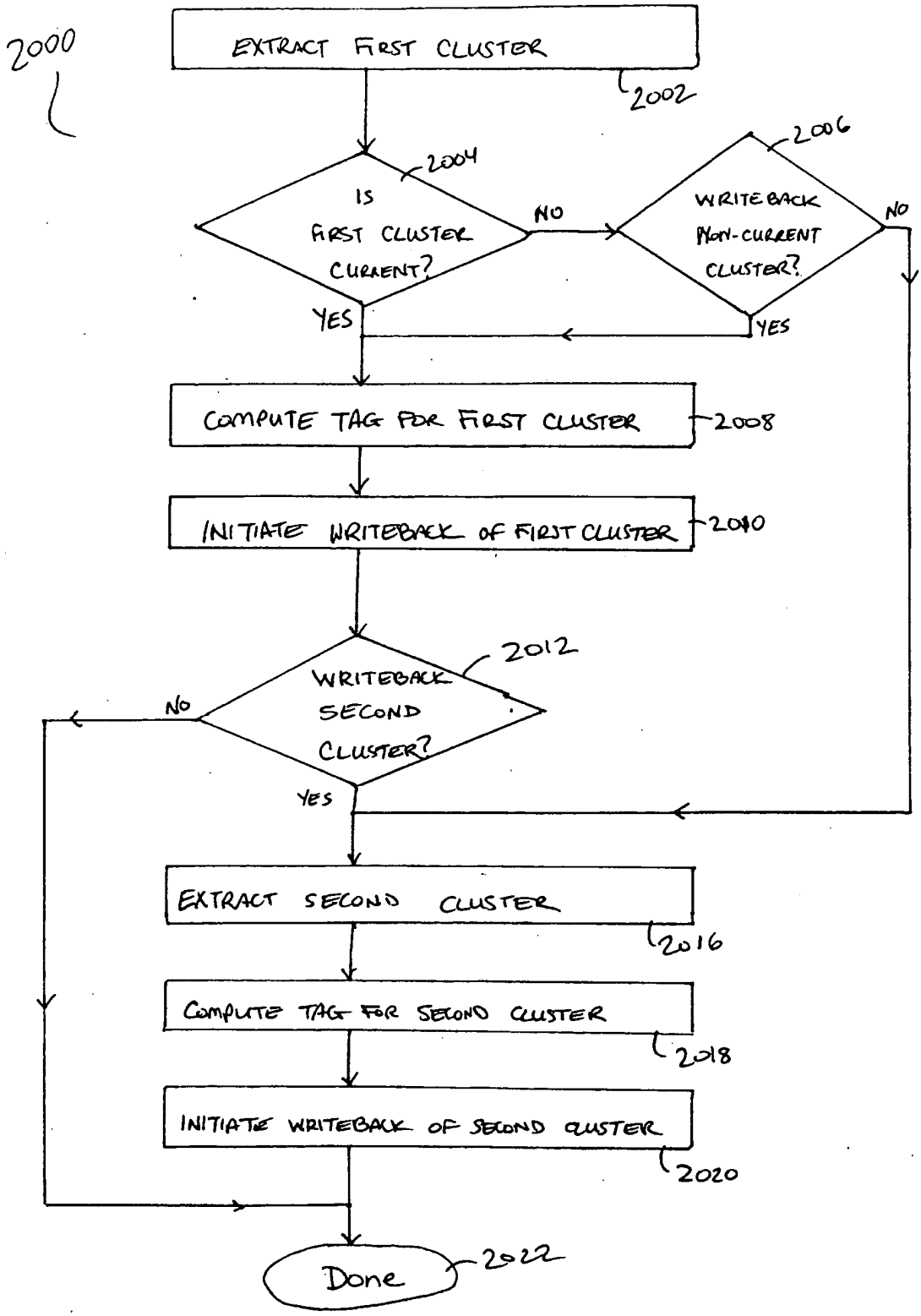
2000
EXTRACT FIRST CLUSTER
2002
2004
IS FIRST CLUSTER CURRENT?
NO
2006
WRITEBACK NON-CURRENT CLUSTER?
NO
YES
YES
COMPUTE TAG FOR FIRST CLUSTER
2008
INITIATE WRITEBACK OF FIRST CLUSTER
2010
2012
WRITEBACK SECOND CLUSTER?
NO
YES
EXTRACT SECOND CLUSTER
2016
COMPUTE TAG FOR SECOND CLUSTER
2018
INITIATE WRITEBACK OF SECOND CLUSTER
2020
Done
2022

FIG. 20

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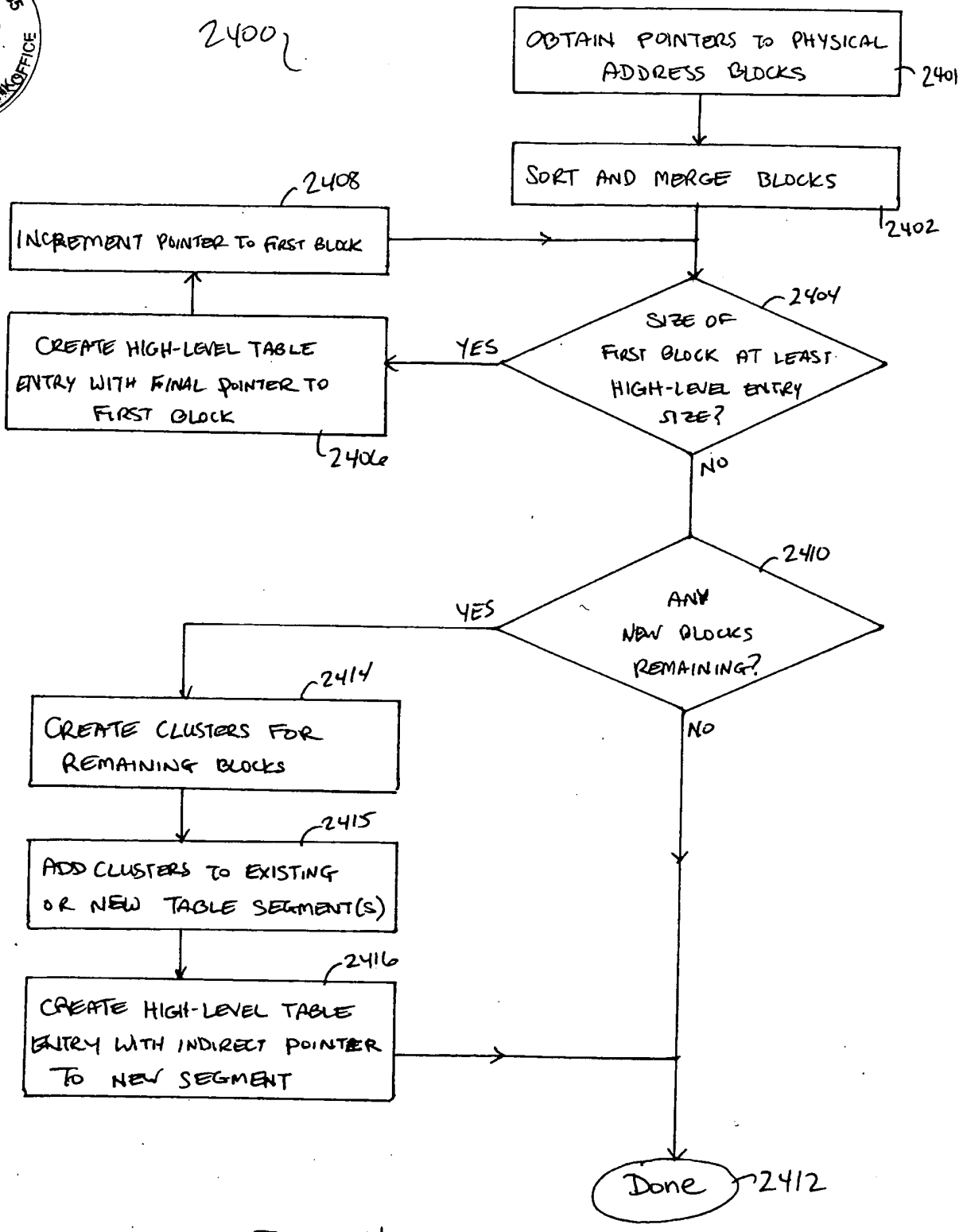

FIG. 24